Antimicrobial Susceptibility Testing pattern from November 2017 to May 2019 at Jackson Fiah Doe Hospital Tappita Laboratory, Lower Nimba County

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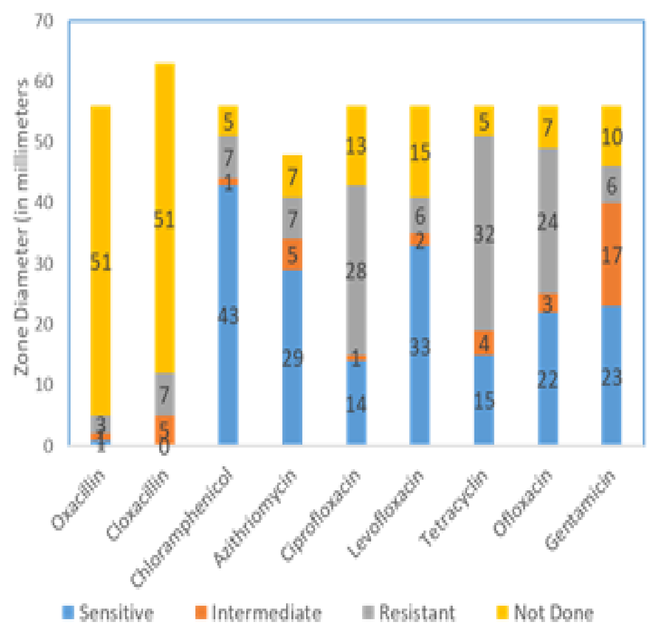
Introduction/Background

Antimicrobial Resistance (AMR) pose a significant threat to public health, especially in resource poor settings with limited restrictions on obtaining and using antibiotics. AMR is results from microorganisms evolving to adapt and flourish in the presence of drugs to which they were once susceptible.[1] Jackson F. Doe Hospital Laboratory conducted bacteriology testing in November 2017 to May 2019. This was after the Academic Consortium Combatting Ebola in Liberia trained seven (7) staff on Bacteriology testing by culture methods. Since then, the Lab has performed 87 antimicrobials susceptibility test on cultured of 229 samples with 112 positive cases isolated. The aim of this study was to establish antibiogram for Staphylococcus spp, Pseudomonas aeruginosa and Escherichia Coli as they are the most prevalent bacteria at the hospital.

Methodology

An experimental study was done to develop antibiogram. Antimicrobial susceptibility testing were performed on isolated organisms utilizing the Kirby Bauer (Disk Diffusion) method. The Kirby-Bauer method is used to determine the sensitivity or resistant to antimicrobials agents to exist doctors in the management of patients.[2] CLSI guidelines for antibiotics selection were followed. Sterile swabs were inoculated on Muller-Hinton and antibiotics disks were dispensed by utilizing Forceps. The Inoculated Muller-Hinton plats was placed in an incubator (35^0 C to 37^0 C) and was observed under 24hrs. After the next day, the zones of inhibitions was measured by a ruler. The results from these testing were consider as ether as sensitive or resistant in accordance with the guidelines of the Clinical Laboratory Standards Institute (CLSI) and standards of the World Health Organization (WHO).

Results



Discussion

The results from the study shows that Chloramphenicol and Levofloxacin were the most effective antibiotics used against Staphylococcus spp, Pseudomonas aeruginosa and Escherichia Coli in the management of patients who suffer illness as a result of these organisms.
The data also shows that 43 out of 87 (49%) Antimicrobial Susceptibility Testing (AST) that was conducted for S. aureus, Pseudomonas aeruginosa, and E. Coli were sensitive to Levofloxacin and Chloramphenicol, while 36% showed resistance to both Trimethoprim, Tetracycline, Ofloxacin and Ciprofloxacin.
The prevalence of antimicrobial resistant is poorly reported in many African countries. This study has displayed very high percent evidence on antimicrobial resistant that require collaborative actions by both the Government of Liberia and the private sectors.

Discussion Cont.

According to the World Health Organization (WHO) 2014 report on Antimicrobial resistant, there was no data recorded for Liberia.. A study conducted in Liberia from 2017 to 2019 revealed significant percent of resistant to over-counter drugs by some nosocomial and community acquired microorganisms. This further revealed the harms and extent to which AMR is fast spreading in Liberia due to the lack of AMR testing and wide-spread use of over-counter drugs. This study has contributed to the awareness on AMR, provided data for Liberia to the Global Antimicrobial Surveillance System (GLASS), and help limit the administration of broad spectral antibiotics to patients by doctors and Physicians. The study has also a clear picture to healthcare administrators about how to procure the most important drugs for pharmacies. However, there was a limitation during the study such as the overuse of one set of antibiotics, insufficient equipment, power shortage to laboratory and insufficient reagents supply. This resulted to performing a little amount of anti-susceptibility test (AST) for isolates.

Conclusion and Key Recommendation

It has been observed that Levofloxacin and Chloramphenicol are the preferred antibiotic in the management of *Staphylococcus spp, Pseudomonas aeruginosa* and *Escherichia Coli*. However, there is a need to conduct similar experiments as often as required to closely monitor for various microorganisms, that could cause life threating diseases, to capture the most effective antibiotics for patient management. More attention should be given to bacterial culturing, sensitivity testing, and timely data collection to effectively support interventions implemented by the Ministry of Health to ensure public health.

References

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